



Indoor Air Quality Tools for Schools

Effective Facility Maintenance for Healthy, High Performance Schools

e-Newsletter

August 2006, Volume 4

The Facility Director's Role in IAQ Management

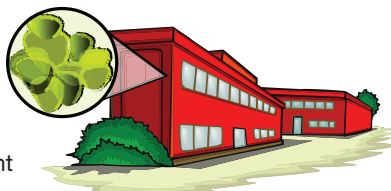
Often the school community assumes that the facility and custodial staff are responsible for ensuring good indoor air quality (IAQ). However, every occupant of the school building has a stake in its air quality. Therefore, everyone has a role to play in addressing IAQ issues and taking action to prevent problems from developing. Because of their knowledge of the school's building systems (e.g., heating, ventilation, and air conditioning (HVAC) equipment), cleaning, and maintenance policies and procedures, the facility directors are often a logical choice to lead a school's efforts to implement a proactive IAQ Management Plan.

Good IAQ can take on a variety of forms in a school. From a well-controlled climate in classrooms to the selection and use of non-toxic cleaning products, facility directors can take steps to ensure a safe and healthy working environment for staff and learning environment for students. The school facility director is in the unique position of being able to see the "big picture" of the school's environmental conditions. Often, the facility director has input on purchasing and management decisions that can affect the school facility. Facility staff interact with students, teachers, administrative staff, and other school personnel on a regular basis. This often provides the facilities staff with the unique ability to see all the components of the total school environment, rather than just isolated pieces.

The *Indoor Air Quality Tools for Schools (IAQ TFS)* Kit provides guidance for establishing and implementing an effective IAQ management program. The Kit provides a variety of tools (from background informational pieces to checklists and instructional videos) designed to walk school personnel through the entire process of developing an IAQ management plan. The IAQ Coordinator's Guide contains model policies for addressing issues related to the indoor environment such as radon, pest management, mold & moisture, among others. The Facility Director is a logical choice to lead the schools efforts to develop and implement an IAQ management program in a school or district and EPA has the resources to help.

Managing Mold and Moisture in Schools

One of the growing environmental issues facing schools today is the problem of unplanned moisture and the subsequent growth of mold. Exposure to mold can often lead to a variety of health effects and symptoms including allergic reactions and increased asthma attacks in



The Charlotte-Mecklenberg School District: *Focus on Facilities*

Like many school districts, the Charlotte-Mecklenberg (NC) Public Schools' (the 25th largest school district in the country) introduction to indoor air quality took the form of negative media attention. Several parents raised concerns that their children were becoming sick due to mold exposure in one of the district's older buildings. While the district took quick action to begin an investigation into possible mold concerns, the parents contacted the local media which generated unfavorable media coverage about the district. Trace amounts of mold were found in the building, which resulted in \$100,000 of renovations, including a new HVAC system.

Prior to the negative media attention surrounding the mold concern, Charlotte-Mecklenberg Schools primarily dealt with IAQ on a reactive basis, like many districts across the country. No formal IAQ management plan existed, and prevention and resolution of IAQ problems was not integrated into the district's day-to-day functioning. With 150 school buildings and over 117,000 students and staff, the district realized that a formal management plan was needed to address IAQ issues proactively and to avoid another mold "crisis."

Among the first steps taken by the district was to obtain a copy of the *IAQ Tools for Schools (IAQ TFS)* Kit and appoint an IAQ Coordinator to oversee the implementation process. The district's safety officer was selected to fill this important position with support from the highest levels of district administration. Each school principal was designated as the on-site IAQ contact helping to manage information sharing, coordinate education about IAQ issues, and ensure that IAQ concerns were forwarded to the district facility staff who would investigate the problem.

As is often the case, one of the biggest challenges implementing an IAQ management program is educating all school staff about the importance of IAQ and each person's role in maintaining good IAQ. To illustrate these concepts, the IAQ team combined several of the checklists contained in the *IAQ TFS* Kit, to create an "Occupant Checklist." Training courses, conducted during staff meetings, were held to educate school staff about IAQ and the district's emerging IAQ Management Plan. Throughout the process, communications between facility staff, the administration, each school's IAQ contact, and school staff were essential in ensuring the development of a management program that would be effective.

sensitive individuals. In an era of tight school budgets, dealing with a mold or moisture problem can create additional strain on facility budgets that may already be stretched too thin. Many facility directors are confronted with a mold problem and are unsure how to proceed. Facility directors may wonder: what are some simple steps that my in-house staff can take to reduce moisture and mold problems? How do I know if I have a mold problem in my school? When should the school district look to an outside contractor for assistance? How do I identify qualified mold contractors?

In 2001, EPA released "Mold Remediation in Schools and Commercial Buildings" to address the questions listed above. This document presents background information on the potential health effects of mold and guidelines for the remediation/clean up of mold and moisture problems in schools and commercial buildings. These guidelines include measures designed to protect the health of building occupants and remediators. It was designed primarily for building managers, custodians, and others who are responsible for school maintenance and can serve as a reference for potential mold and moisture remediators. Individuals with little or no experience with mold remediation should be able to make a reasonable judgment as to whether the situation can be handled in-house. It can help those in charge of maintenance to evaluate an in-house remediation plan or a remediation plan submitted by an outside contractor.

The document contains guidance on how to prevent moisture problems from developing; how to assess water damage and conduct clean up activities to prevent mold growth; and remediation guidelines should a mold problem emerge. The following is a sampling of some of the items a school facility director should address when assessing a moisture problem and dealing with mold growth.

Investigate and evaluate moisture and mold problems

- Assess size of moldy area (square feet).
- Consider the possibility of hidden mold.
- Clean up small mold problems and fix moisture problems before they become large problems.
- Select a remediation manager for medium or large size mold problems.
- Investigate areas associated with occupant complaints.
- Identify source(s) or cause(s) of water or moisture problem(s).
- Note type of water-damaged materials (wallboard, carpet, etc).
- Check inside air ducts and air handling unit.
- Throughout process, consult qualified professional, if necessary or desired.

Remediate moisture and mold problems

- Fix moisture problems, implement repair plan and/or maintenance plan.
- Dry wet materials within 24-48 hours to prevent mold growth.
- Clean and dry moldy non-porous materials.
- Discard moldy porous items that can't be cleaned.

Today, the Charlotte-Mecklenberg School District has an effective, proactive IAQ management program in place. While the facilities department still takes the lead on collecting and responding to IAQ problems, everyone in the district is involved in the process. The district has instituted a formal IAQ incident organizational chart to track the work-flow of an IAQ complaint. Every complaint is investigated within 24 hours. Any corrective action taken is communicated back to personnel in the school. The district now has a written IAQ management plan and awareness and importance of IAQ issues among district staff is at the highest level. The Facilities Department is now seen as effectively working to address IAQ and other problems, as well as helping to create a healthier environment for students and staff.

The Charlotte-Mecklenberg Schools took an unfortunate situation (i.e., negative media attention regarding a mold problem) and used that as the basis for establishing an active IAQ management program. Although the Facilities Department led the effort to implement the *IAQ TFS* Program, personnel from the entire district became involved in the process. Now IAQ is not perceived as just "a facilities issue." Rather, the Facilities Department plays the key role in coordinating the IAQ management plan, while also soliciting valuable information from the entire school staff. In 2004, Charlotte-Mecklenberg Schools was a recipient of EPA's *IAQ TFS* Excellence Award. They are also a member of the American Association of School Administrators Urban Resource Coalition.

Top Ten Tips for Facility Managers

- 1 Implement a comprehensive, district-wide indoor air quality maintenance program consistent with the U.S. EPA's *IAQ TFS* Program.
- 2 Conduct regular building walkthrough inspections, and measure temperature, relative humidity, carbon monoxide, and carbon dioxide. Following the school walkthrough, identify and prioritize indoor air quality problems in the school.
- 3 Ensure that all HVAC system air supply diffusers, return registers, and outside air intakes are clean and unobstructed. Regularly change filters and ensure condensate (or drip) pans are draining properly.
- 4 In order to flush polluted air out of the school, bring adequate outdoor air into the building using the school ventilation system. Maintain minimum outdoor air ventilation rates consistent with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard 62.1, which for classrooms is about 15 cubic feet per minute (cfm) of outdoor air per person.
- 5 Maintain indoor humidity levels between 30 percent and 60 percent to ensure comfort and reduce problems with mold and bacteria.

The key to resolving moisture and mold problems in schools is a combination of quick action and effective communications.

For more information about moisture and mold and to obtain a copy of “Mold Remediation in Schools and Commercial Buildings,” visit: www.epa.gov/mold. For information on effective communications about IAQ in schools, please see EPA’s “IAQ Tools for Schools Communications Guide” available online at: www.epa.gov/iaq/schools/images/communication_guide.pdf.

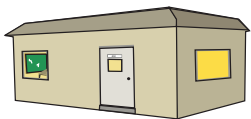
Facilities Spotlight: The School Debate about Portable Classrooms

Portable classrooms, also commonly known as “trailers,” “portables,” “temporaries,” “relocatables,” or “modulars,” have been a feature of many school districts’ building stock for years. From a school district’s perspective they provide a quick and relatively inexpensive way to address unpredictable peaks in school enrollment, limited building construction funds, and the time lag between identifying the need for more space and the time for constructing new facilities. However, for many school districts, portable classrooms are seldom moved and become permanent fixtures of the school.

Recent surges in student populations in some parts of the country have fueled an explosion in the use of portable classrooms, raising concerns about the healthfulness of portable classrooms.

What is a Portable Classroom?

By definition, structures smaller than 2,000 square feet are considered “portable,” but the distinction between “portable” and “not portable” can be easily blurred by manufacturers who often build structures larger than 2,000 square feet with relocation in mind.



Building design and materials used distinguish temporary from permanent portable classrooms. Temporary portable classrooms are inexpensive, pre-fabricated units that offer a limited choice of construction materials and mechanical systems. Permanent portables come custom-built as either stand-alone structures or additions to existing conventional structures. Today, manufacturers can produce temporary or permanent, single room or multi-story portables with concrete floors, brick exteriors, cable hook-ups, electrical systems, plumbing systems, HVAC systems, and bathrooms. These classrooms can look so complete that they are difficult to distinguish from conventional school buildings.

Benefits of Portable Classrooms

The use of portable classrooms has become more widespread, as they are a quick and relatively inexpensive solution to a variety of challenges that schools may encounter.

- Portables relieve overcrowding in original school buildings

- 6 Regularly clean and remove dust from hard surfaces with a damp cloth, and vacuum using high-efficiency filters.
- 7 Follow the U.S. EPA’s guidelines for the [prevention and remediation of mold](#).
- 8 Promptly fix moisture problems, including those from roof, window, and plumbing leaks. Thoroughly dry wet areas within 24-48 hours to prevent mold growth.
- 9 Employ [integrated pest management](#) (IPM) methods in your school instead of traditional pesticide-based methods.
- 10 Use low volatile organic compound (VOC) paints, adhesives, and cleaning products that emit lower levels of gases into the air.

The Ten Tips for Facility Managers are just a few of the many ways that school facilities staff can impact the indoor environment. In many cases, the facility staff may already be implementing these measures, but have not thought about them in the context of a comprehensive IAQ management program. One primary purpose of the *IAQ TFS* Program is to help school facility staff incorporate policies and procedures already in place with additional steps that can be taken to create a healthy learning environment. Controlling pollutants, maintaining building systems, and establishing effective communications procedures can help create a healthy and safe, high performance educational environment.

For more information on how a facility director and facilities staff can be involved in school IAQ management, visit EPA’s *IAQ TFS* Program Web site at www.epa.gov/iaq/schools.

and help to reduce the student-to-teacher ratio.

- Temperature and air-conditioning settings can be controlled on a room-by-room basis.
- Portable classrooms allow school districts to provide extra space quickly, as they can easily be moved from one site to another and can be assembled quickly. For example, the state of California owns several portable classrooms and leases them on an as-needed basis to school districts throughout the state.
- Construction of portable classrooms does not place as much demand on school administrators for organization and management of construction companies as conventional classrooms. Manufacturers of portables assume total responsibility for architectural design, construction, and project management on their own construction sites before they are delivered to the school.

Several attractive options are available for financing portable classrooms, such as purchase, lease, or lease-to-buy.

Portables can cost as little as one-third as much as conventional classrooms. On their balance sheets, schools can list portables as tangible assets that can be re-sold. In spite of the supporting arguments for cost savings, convenience, and other benefits of portables, public perception of the potential environmental and health impacts attributable to portables overrides their widespread acceptance.

Common Concerns about Portable Classrooms

Criticism of portable classrooms spans a range of concerns, from aesthetic complaints to poor air circulation. While some people may find portable classrooms unsightly, issues of overcrowding in schools and potential health risks associated with portables have received the most attention from parents, media, government, and school administrators in recent years.

The most common problems with portable classrooms include:

- Poorly functioning HVAC systems that provide minimal ventilation with outside air.
- Poor acoustics from loud ventilation systems.
- Chemical off-gassing from pressed-wood and other high-emission materials may be of greater concern because there is often a higher usage of these products in portables.
- Water entry and mold growth.
- Site pollution from nearby parking lots or loading areas.

Environmental groups, doctors, and researchers contend that portable classrooms are more prone to IAQ problems than conventional classrooms. They argue that the combination of materials used in construction, tighter construction design (originally intended to save energy), smaller buildings, fewer windows, and inadequate ventilation in portable classrooms can lead to a greater build-up of indoor air pollutants than in conventional school buildings. According to the publication "Reading, Writing and Risk: Air Pollution Inside California's Classrooms," higher concentrations of volatile organic compounds (VOCs) have been found in some portable classrooms than in traditional school buildings. Materials used in new portable classroom construction, such as pressed-wood products, contain higher concentrations of formaldehyde, if not properly off-gassed, the result could be elevated levels of airborne chemicals, especially if ventilation is reduced.

Because portable classrooms are intended only for temporary use, although they often become permanent installations, the products selected for portables may be of lower quality than those purchased for permanent classrooms. Care should be taken during specification and selection to ensure that the students' health is not compromised for inexpensive, low quality designs. When districts specify a portable design, they typically create a term contract that other districts can use to purchase the same (or slightly different) design. This practice (often called "piggy-backing") can save a district valuable time and money on specifications and approvals, but it can also compound poor decisions made in the original procurement.

California Study on Portable Classrooms

In November 2003, the California Air Resources Board and the California Department of Health Services issued a report on a study of the use of portable classrooms by school districts in California. This report of the use of portable classrooms in California is the most in-depth study to date. California is one of the most widespread users of portable classrooms in the U.S. because of exponential growth in student enrollment in California's public schools. In a projection report, the Department of Education indicated that, between 2001 and 2013, school enrollment in California will increase an astounding 15.7 percent. Portable classrooms help schools resolve the dilemma of where to house this influx of students. The report indicated that portable classrooms have more HVAC problems than traditional classrooms, including higher rates of dirty air filters, blocked outdoor air dampers, and poor condensate drainage, which can lead to microbial contamination. The report also claimed that teachers in portable classrooms turn off ventilation systems 60 percent of the time due to excessive noise. By comparison, in conventional classrooms, teachers turn off ventilation systems 23 percent of the time due to excess noise. In the report, the California Air Resources Board and California Department of Health Services offered recommendations for maintaining healthy classroom environments, applicable for both portable and conventional classrooms. Unfortunately, this study did not provide the answer to the debate of whether portable classrooms adversely impact children's health more than conventional classrooms. In closing, the report encouraged schools to develop and require full building commissioning procedures for new buildings and classrooms to ensure proper building performance from the start, including testing for lighting, HVAC, and other building systems.

Recommendations for Schools Using Portables

For schools choosing to lease or purchase portables, the following steps can help them to maintain a healthy indoor environment.

- ▶ To prevent IAQ from becoming a problem, train facilities and maintenance staff to maintain portables and conventional classrooms properly and consistently.
- ▶ Establish a schedule for replacing filters, checking vents, dampers, moisture levels, etc.
- ▶ Educate teachers on how their actions contribute to the quality of the school's indoor environment.
- ▶ Develop and implement a "watch" list for teachers to use in their classrooms. Include items such as turning

Maintaining Healthy IAQ in Portables

One key approach to avoiding potential IAQ problems in portable classrooms is ventilation. The amount of outside air delivered to most classrooms is often inadequate due to improper use or operation of HVAC systems. For example, outside air dampers are frequently closed or set too low, either as an energy-saving technique or because the HVAC systems arrived from the manufacturer with the dampers set in the fully closed position—a shipping requirement that schools often fail to notice. A California study showed that 60% of teachers in portables sometimes turn their HVAC systems off due to excessive noise. Some ventilation systems have never had their air filters changed or are operating with packing and shipping materials still inside the unit. It is critical that schools perform routine maintenance of ventilation systems and educate teachers, particularly those with access to classroom HVAC controls, on how to properly maintain and operate classroom ventilation systems.

The same problems—lack of ventilation, improper cleaning and maintenance, poorly functioning HVAC, and others—can exist in any indoor environment. Like all school facilities, portable classrooms should contain appropriate building and indoor surface materials and properly designed ventilation systems to minimize the presence of indoor pollutants. Commissioning and regular maintenance are important to maintaining the quality of the indoor environment in portable classrooms and school facilities.

Facility Maintenance During Vacation: *A Spotlight on Floor Covering Decisions*

While many members of the school community look forward to vacation (spring, summer, and holiday breaks), for the facilities department, this marks the beginning of a major period of activity. Large cleaning, renovation, and repair projects often occur during these breaks. As the school year moves forward, maintaining the indoor environment for students should be a top priority for facilities staff and custodians. Facilities and maintenance staff can use vacation time as an opportunity to refresh and update maintenance practices. They should also conduct building walkthroughs of the school using maintenance and walkthrough checklists provided in EPA's *IAQ TFS Kit*. Beginning this process before students return from school breaks makes it easier for facilities staff.



Floor Covering

One area of particular concern to facilities staff is selecting and maintaining floor coverings. Due to decreased traffic

on vents one hour before class starts, watching for rust spots, wet spots, and other signs of deterioration of infrastructure.

- ▶ Educate teachers about the potential risks of turning off HVAC systems.
- ▶ Follow installation and maintenance instructions for the systems provided by the manufacturer.
- ▶ Ensure the portable's HVAC system is designed and operated to provide a minimum outdoor air ventilation rate consistent with ASHRAE Standard 62.1, which for classrooms is about 15 cfm of outdoor air per person. Outdoor air should be provided continuously when a classroom is occupied.
- ▶ Prior to use of any new portable classrooms by staff or students, HVAC systems can be operated at their maximum outdoor air intake rate continuously for several days to "flush out" pollutants. During this period outdoor air should be thermally conditioned (i.e. heated or cooled), as needed, to typical indoor temperatures.
- ▶ Check for stains or rust spots that indicate water exposure. Fix moisture problems, implement repair plan and/or maintenance plan.
- ▶ Specify and request particle board that is free of urea-formaldehyde resins in all construction and purchasing, even though it may be 30 percent more expensive. Formaldehyde is a hazardous air pollutant, as identified in the 1990 Clean Air Act and is classified as a carcinogen.
- ▶ Identify which windows may be opened by occupants, which can provide fresh air exchange and natural ventilation, to supplement the mechanical ventilation provided by the HVAC system.
- ▶ Place portables away from sprinkler systems and other sources that can lead to excessive moisture or collection of rainwater around the foundation.
- ▶ Locate classrooms away from areas where vehicles idle. Make sure that building air intakes are located away from any exhaust outlets or other contaminant sources to prevent the intake of exhaust from school buses and cars and pollutants from other outdoor contaminant sources.
- ▶ Do not use carpets in entry-ways to classrooms with direct outdoor access. This allows for the collection of water, dirt, or other pollutants that can easily be tracked into the room. Supply waterproof mats over entryways and other areas used for drying clothing and umbrellas. Clean up any water on the floor or walls as soon as it's apparent.
- ▶ Check that special-use classrooms (e.g., chemistry, biology, fine arts) using chemical or odor-producing products have local exhaust ventilation.

throughout the school building during the school break, this may be an ideal time for conducting renovation and replacement activities relating to flooring. What information is available to assist the facilities department in making these decisions?

At EPA's 5th Annual *IAQ T&S* Symposium in December 2004, professionals in the field of facility management conducted a panel discussion on the topic of floor coverings, facility maintenance, and the effect of different flooring types on IAQ in schools. The process of reviewing options and selecting products for use in schools should consider the ultimate goal of building design and maintenance: creating and maintaining a healthy, high performance learning environment. For some areas in schools (like cafeterias), hard flooring is an obvious choice. However, determining appropriate floor coverings for such areas as classrooms and hallways requires more thought and consideration. The process of selecting the best floor covering for a particular area of the building should consider the following criteria: the initial cost (purchase and installation), the life cycle cost (cost to maintain and longevity), the product's effect on IAQ (e.g., toxicity of material, VOC content, cleaning products and methods), the product's impact on the learning environment (e.g., acoustics, lighting, thermal comfort, safety), and the preferred product. Use these criteria to evaluate options of floor coverings and determine the best and most rational flooring option for each area of the school building.

A major consideration in selecting appropriate floor coverings is the cost of cleaning the product. Cleaning is the essential ingredient to create and maintain a healthy and safe, high performance indoor environment. Clean buildings are less expensive to maintain than dirty buildings. Preventive maintenance and proactive cleaning practices help to reduce the overall cost and time required to maintain school buildings.

Administrative commitment and buy-in is important to secure support for the maintenance of healthy, high performing schools. Administrators can approve funding for professional development and training for facilities personnel on proper maintenance procedures. Professional development is a worthwhile investment for schools. Custodians and maintenance staff are the "guardians" of a school's indoor environment. As such, they "must be well-trained, skilled, and professional in order to create a quality environment, prevent accidents, recognize warning signs, troubleshoot emergencies, and have complete facility operation awareness." (NEA HIN, 2004) Providing facilities staff with opportunities for professional education will help administrators to ensure that their facilities staff have the professional training necessary to select appropriate materials for the maintenance of school facilities as well as the knowledge of appropriate cleaning procedures that will ensure routine maintenance of high performing schools.

Conclusion

Even if the U.S. were not facing an impending school-age population boom, school districts would still have portables among their preferred options for accommodating students because of their convenience, flexibility, and cost effectiveness. Portable classrooms will be a part of school landscapes for a long time to come, and schools need to ensure that portable learning environments are as safe as conventional classrooms. School districts need to pay attention to the basic principles of building ventilation, location, and maintenance for portables to ensure that all classrooms, not just portables, are welcoming and safe spaces where children can perform well.

How to Choose and Maintain Floor Coverings

- ▶ Use walk-off mats at every building entrance to prevent tracking in dirt, water, and other pollutants from outdoors.
- ▶ Select floor coverings appropriate for the function of each space (e.g., use resilient floor coverings in cafeterias, art rooms, science rooms, and other areas where spills are likely; use carpet in quiet areas such as administrative areas and libraries).
- ▶ Choose products with low VOC emissions (e.g., carpets with no wet adhesives, resilient flooring with low-VOC adhesives).
- ▶ Use products with proven track records for quality and durability.
- ▶ If carpet is specified, ensure the carpet, cushion, and adhesive are constructed to prevent liquids from penetrating the backing layer where moisture under the carpet can result in mold growth.
- ▶ Only use cleaners that do not leave behind detergent residue.
- ▶ If available, select carpets with 100% certified recycled content backing.

Be Proactive to Ensure a Healthy, High Performing School

Proactive facility maintenance and cleaning is essential, especially over school breaks, to maintain a clean and healthy, high performance school environment. Following appropriate protocols for maintaining healthy buildings and using safe and effective cleaning practices can help to limit health risks resulting from unnecessary human exposure to hazardous products. EPA's *IAQ T&S* Program and Kit and related programs offer a wealth of useful tips and voluntary guidelines on all topics relating to facility maintenance and cleaning of school buildings.

For more information on these topics, visit EPA's *IAQ T&S* Program Web site at www.epa.gov/iaq/schools, the *IAQ Design Tools for Schools* Program Web site at www.epa.gov/iaq/school design, and the Healthy School Environments Web Portal at www.epa.gov/schools.

EPA's Resources and Environmental Programs for Schools

EPA is a strong advocate for creating and maintaining healthy and safe school environments. For this reason, it has established several school-based voluntary programs to address a variety of environmental factors that schools encounter each day. These voluntary, school-based programs raise awareness for the importance of creating and maintaining healthy and safe indoor and outdoor school environments for students and staff. Many of these programs are specific to the operations and procedures of a school's Facility Department. Each program offers a wealth of free information and voluntary guidance on how schools can address the variety of environmental factors that affect school buildings, children, and staff. Each of these programs can easily be used on its own or in conjunction with others.

A well-rounded, practical school-based environmental program can yield overall improved performance of students, staff, and facilities. To make implementation easy, all guidance is voluntary, and all printable program materials are available free of charge from the IAQ Information Clearinghouse (1-800-438-4318 or iaqinfo@aol.com) or the National Service Center for Environmental Publications (1-800-490-9198 or ncepimal@one.net).

More details about each of these voluntary programs are provided below.

- Healthy School Environments Web Portal
- Healthy School Environments Assessment Tool
- Clean School Bus USA
- ENERGY STAR® for K-12 Schools
- *Indoor Air Quality Design Tools for Schools*
- Integrated Pest Management in Schools
- Lead in Drinking Water: Schools and Daycare Centers
- Radon in Schools
- Mercury in Schools
- Asbestos in Schools
- SunWise

Healthy School Environments Web Portal

The Healthy School Environments Web Portal is a Web-based resource which EPA developed in 2003 as a "one stop shop" for links to resources and facts on topics related to environmental health in schools. The Portal provides school staff with information on managing environmental factors that can affect the safety of the school building and the health of its occupants. The Healthy School Environments Web Portal serves as a gateway to on-line resources to help facility managers, school administrators, architects, design engineers, school nurses, parents, teachers, and all school staff address a variety of environmental health issues. Topics addressed include chemical use and management, building design,

construction, building renovation, energy efficiency, facility operations and maintenance, legislation and regulation, outdoor air pollution, portable classrooms, waste reduction, and drinking water.

For additional information on the above topics and more, visit www.epa.gov/schools.

Healthy School Environments Assessment Tool



The Healthy School Environments Assessment Tool (Healthy SEAT) is a no-cost comprehensive resource that school districts can use to evaluate and manage their facilities for key environmental, safety, and health issues. This tool includes fully customizable checklists to help school district level staff conduct self-assessments and database software that allows schools to manage all aspects of their assessment programs. In addition to powerful software that can be used by districts to track any facility issue it chooses, on a school by school basis, EPA has also included critical elements of all its regulatory and voluntary programs for schools, as well as Web links to more detailed information.

For more information and to download the Healthy SEAT, visit www.epa.gov/schools.

Clean School Bus USA



EPA launched the Clean School Bus USA Program in 2003 to address rising concerns over the condition of America's aging school bus fleet and the health effects on children resulting from exposure to diesel exhaust from idling school buses. Since its inception, Clean School Bus USA has experienced many successes, and EPA has provided grants to school districts across the country to fund the replacement of old school buses with new buses that use cleaner fuels.

Did you know that 24 million children ride a school bus each day, and students spend an average of more than one hour on a school bus each day? Traditionally, school buses have used diesel fuel. Pollution from diesel-fueled vehicles has health implications for everyone, especially children. Reports have identified a strong correlation between exposure to diesel exhaust and respiratory symptoms similar to asthma (e.g., allergies, wheezing, cough, labored breathing). Noting these facts, among others, EPA launched the Clean School Bus USA Program in April 2003.

Clean School Bus USA is the newest of EPA's voluntary school-based programs. In partnership with national business, education, transportation, and public health organizations, EPA aims to promote clean and safe school transportation for children to ensure that school buses remain one of the safest ways for children to travel to and from school. Among EPA's goals for Clean School Bus USA are:

- Reduce children's exposure to diesel exhaust that enters school buildings.
- Reduce pollution from school buses.
- Encourage schools to implement "anti-idling" policies and practices that will eliminate unnecessary exposure to diesel exhaust in the school yard.
- Upgrade or "retrofit" older buses with better emissions control technologies.
- Fuel buses with cleaner fuels.
- Replace the oldest buses in the U.S. school bus fleet with new, less polluting buses.

To support EPA's efforts to reduce pollution from school buses, Congress allocated \$5 million for a cost-shared grant program designed to assist school districts in upgrading their bus fleets. For the first grant competition in 2003, EPA received over 120 applications requesting nearly \$60 million in funds. Seventeen demonstration projects were selected for funding. The projects will demonstrate a variety of approaches to reducing pollution from school buses. These demonstrations will involve about 4,000 buses and remove over 200,000 pounds of diesel particulate matter from the air over the next ten years.

Building on the 2003 Clean School Bus USA demonstration grants program, Congress again allocated \$5 million for school bus retrofit and replacement grants in 2004. EPA selected 20 projects for funding a diverse set of demonstrations around the nation.

In Fiscal Year 2005, Congress allocated \$7.5 million for the Clean School Bus USA cost-shared grant program. EPA received over 170 applications requesting nearly \$50 million in grant funding.

For more information on the Clean School Bus USA Program, visit the Program Web site at www.epa.gov/cleanschoolbus/.

ENERGY STAR® for K-12 Schools



EPA's ENERGY STAR Program for K-12 schools offers suggestions for simple building improvements, which can reduce annual energy expenses by 25 to 30 percent. EPA's ENERGY STAR Web site offers a variety of tools and information that can help schools check their buildings' current energy performance and benchmark their buildings over time to monitor energy use and savings.

EPA's voluntary ENERGY STAR Program offers information for schools on how to incorporate building improvements that will help to reduce energy costs. Did you know that the annual energy bill for America's primary and secondary schools is an astounding \$6 billion? By making simple building improvements – replacing outdated, old, and poorly functioning building equipment, and improving operations

and management practices – schools can reduce annual energy expenses by 25 to 30 percent. EPA's ENERGY STAR Program for schools offers the only national rating system for measuring energy performance, prioritizing energy upgrades, and undergoing building improvements to improve energy efficiency.

EPA's ENERGY STAR Web site offers a variety of valuable on-line tools and information resources, such as the Portfolio Manager, Energy Benchmarking, and online presentations. Schools can use these resources to improve building management practices, incorporate energy upgrades, and reduce long-term energy costs.

For more information on the ENERGY STAR for K-12 Schools Program, please visit EPA's Program Web site at www.energystar.gov and click on the "Education" link under "Business Improvement."

Indoor Air Quality Design Tools for Schools



EPA introduced *Indoor Air Quality Design Tools for Schools (IAQ DTfS)* as a complement to the *IAQ TFS* Program. *IAQ DTfS* is voluntary Web-based guidance for schools on how to design healthy, high performing schools from the ground up and incorporate IAQ practices during building maintenance and renovations. *IAQ DTfS* offers free, voluntary guidance for schools on effective design, construction, renovation, operations, and maintenance of school facilities targeted to school administrators, building design teams, construction supervisors, and facility managers.

Key topics addressed on the *IAQ DTfS* Web site include: pre-design, HVAC systems and maintenance, controlling pollutants and pollutant sources, moisture (and mold) control, construction, building commissioning, building operations and maintenance, pest control, renovation and repair, and portable classrooms. EPA offers this information to promote the importance of high performance schools for maintaining building environments with good IAQ. The site offers useful guidance on selecting and purchasing building products that can improve the indoor environmental quality of the school. Information available on the Program Web site strengthens the links between environmental factors and student and staff health and performance.

For more information, visit the *IAQ Design Tools for Schools* Web site at www.epa.gov/iaq/schooldesign.

Integrated Pest Management in Schools

EPA's Integrated Pest Management (IPM) Program for schools offers voluntary guidance and tips for how schools can incorporate "green" building maintenance practices and environmentally sensitive, lowest-impact chemical control of pests in the school environment to reduce the use of common toxic pesticides.

Through the IPM in Schools Program, EPA offers a wealth of free information to help schools incorporate cultural, mechanical, and lowest-impact chemical control technologies and environmentally sensitive approaches to managing pests in schools. By limiting the use of toxic cleaning and maintenance products, schools can reduce the potential for building occupants to have adverse allergic reactions to toxic chemical exposure, specifically to pesticides utilized by schools.

Common IPM practices that EPA advocates for schools include:

- Place vegetation, shrubs, and wood mulch at least one foot from structures.
- Fill or eliminate cracks and crevices in walls, floors, and pavement.
- Empty and clean lockers and desks at least twice a year.
- Clean food-contaminated dishes, utensils, and surfaces each day.
- Clean garbage cans and dumpsters regularly.
- Apply fertilizer several times per year, rather than in one heavy application.
- If the use of pesticides is necessary, use spot treatments instead of area-wide applications.

Several print and on-line resources are available from EPA and other organizations, such as the National Pesticide Information Center, on how to incorporate IPM practices in routine school maintenance schedules.

For more information, visit EPA's IPM Program Web site at www.epa.gov/pesticides/ipm.

Lead in Drinking Water: Schools and Daycare Centers

EPA developed the Lead in Drinking Water Program for Schools and Day Care Centers to educate schools on facts regarding lead in drinking water and potential health impacts for children. Young children and infants whose main diets consist of liquid can get 40 to 60 percent of their lead exposure through water. EPA encourages schools and day care centers to test water for lead concentration at all fixtures used for drinking, cooking lunch, and preparing juice or formula. This will help to reduce the potential for children's exposure to lead.

For more information on EPA's Lead in Drinking Water Program for Schools and Day Care Centers, visit www.epa.gov/safewater/lcmr/pdfs/report_lcmr_schoolsummary.pdf.

Radon in Schools

EPA introduced the Radon in Schools Voluntary Program in an effort to communicate facts on radon, to raise awareness of the dangers of radon exposure, and to encourage schools to test for radon. A nationwide survey showed that nearly one in five schools in the U.S. had at least one school room with a radon level above EPA's recommended action level of 4

picoCuries per liter (4 pCi/L). EPA estimates that more than 70,000 school rooms have high short-term radon levels and encourages students, teachers, and parents to be aware of radon as a potential problem in their schools. To date, approximately twenty percent of schools in the U.S. have tested for radon. EPA encourages schools to contact their state's radon office for additional technical assistance and guidance about how to lower radon levels in schools.

To promote testing, EPA established three easy steps for schools to test for radon:

- Conduct initial testing in all frequently used rooms at or below ground level. These areas of a school building are at highest risk for elevated radon levels because radon is a soil gas that moves through the ground and can seep into a building through cracks and other holes in the foundation.
- Conduct follow-up testing in rooms with radon levels of 4 pCi/L or higher.
- Take action to reduce elevated radon levels.

The document "Radon in Schools (2nd Ed.)" and your state radon office offer tips and action items for reducing radon levels in schools, homes, and other buildings at risk for high levels of radon.

For more information on EPA's Radon in Schools Program, visit www.epa.gov/iaq/radon/pubs/schoolrn.html.

Mercury in Schools

The Mercury in Schools Program offers information and guidance for school administrators, faculty, staff, local health jurisdictions, and parent groups on how to reduce the hazards of mercury exposure in schools. Mercury is used in many items commonly found in schools, such as thermometers, barometers, switches, thermostats, flow meters, lamps, and laboratory reagents in chemistry and science labs. Two major causes of mercury spills at schools are improper storage and mishandling of these items. EPA encourages schools to prevent spills by removing all mercury compounds and mercury-containing equipment and by discontinuing their use. The Program Web site offers a variety of resources, including information on state-based mercury programs for schools, EPA's Schools Chemical Cleanout Campaign (SC3), and school case studies.

For more information on EPA's Mercury in Schools Program, visit www.epa.gov/mercury/schools.htm.

Asbestos in Schools

The presence of asbestos in high-activity public buildings such as schools presents the opportunity for inadvertent disturbance and potential for exposure. Consequently, EPA created a Web resource addressing asbestos in schools. This resource contains information on the Asbestos

Hazard Emergency Response Act (AHERA), which requires public and private non-profit primary and secondary schools to inspect their buildings for asbestos-containing building materials. Additional resources include a fact sheet on asbestos management in schools, a summary of health effects of asbestos, frequently asked questions about asbestos in schools, and useful links to other EPA and non-EPA resources.

To learn more, visit www.epa.gov/asbestos/asbestos_in_schools.html.

SunWise



SunWise is a collaborative partnership between EPA, schools, and many other organizations committed to educating

the public about the dangers of exposure to the sun. It is a nationwide program for grades K-8 that encourages schools to provide sun-safe infrastructure (including shade structures) and policies that promote sun protection. The Program brings together schools, communities, teachers, parents, health professionals, environmental groups, meteorologists, and educational organizations to raise awareness for sun safety. It offers sample activities and ideas for elementary and middle school teachers to promote sun safety practices at school and at home. These activities raise awareness of sun safety and the importance of protection from harmful UV rays.

Any U.S. elementary or middle school can participate in the program and can become a SunWise partner school by completing three simple tasks:

- Filling out the registration form on EPA's Program Web site;
- Completing the "Student Survey" before and after implementation of SunWise activities; and
- Adopting at least one supplemental SunWise school activity.

The SunWise Web site offers a wealth of ideas and suggestions for extra SunWise school activities such as cross-curricular classroom lessons, measuring UV levels and posting results on the school Web site or in the school building, enhancing school infrastructure with shade structures, and conducting community outreach, such as inviting guest speakers to talk to students about fun, sun safety practices. The Program Web site also offers a Tool Kit of resources and ideas for SunWise activities, an Internet Learning Site and UV database, and free educational materials (e.g., fact sheets, brochures, activity books, posters, newsletters) with facts on sun safe practices.

For more information on EPA's SunWise Program, visit www.epa.gov/sunwise.

Schools Chemical Cleanout Campaign and Prevention Program

Accidental spills of potentially dangerous chemicals endanger students and staff, result in school days lost, cost millions of dollars to clean up each year, and are, in many instances, preventable. When chemicals are improperly used or stored

they can put students, staff, and others at risk from spills, explosions, or other accidental exposure. Thus, mismanaged chemicals represent critical environmental health and safety issues schools must address to improve the learning environment for children and to provide a healthy workplace for teachers and staff.

The Schools Chemical Cleanout Campaign and Prevention Program (SC3) builds upon the lessons learned and accomplishments of existing state and local efforts to decrease the number of injuries and school days lost due to poor chemical management and chemical spills. The goals of SC3 are to raise national awareness of the potential dangers of chemical accumulations in K-12 schools and facilitate chemical cleanout and prevention of future chemical management problems.

A chemical cleanout and prevention program will:

- Protect the health and safety of children and school personnel
- Prevent fires and spills
- Prevent school closures
- Protect the environment
- Save money, reduce liability

Successful cleanout and prevention programs are customized to meet the specific needs of school districts. Several elements are common to all successful programs. These elements include:

- On-site technical assistance
- Education and hazard awareness training for school personnel
- School commitment to ensure proper chemical management
- Adequate funding for chemical disposal
- Partnerships with other organizations to achieve program goals

EPA encourages school districts and communities to promote a safer learning environment. Valuable resources for teachers, administrators, and community partners can be found at: www.epa.gov/sc3.

Resource for Urban School Districts

The American Association of School Administration

(AASA) Urban Resource Coalition Focuses on IAQ Efforts of Urban School Districts

The AASA has been intimately involved in indoor air quality issues since 1992 and has been a long time partner with EPA to educate schools about the effects of poor indoor air quality on children's health and continues to encourage the adoption of proactive indoor air quality management

programs or similar to EPA's *IAQ T&S* among school administrators.

AASA recognizes that all schools need education and technical resources and support when addressing the growing issue of poor indoor air quality in schools, but this is particularly true of urban school districts. These school districts have higher numbers of impoverished or low-income families, and higher rates of children with asthma. Urban schools enroll 24% of all public school students, 35% of poor students, and 43% of minority students in the nation. As a result, the AASA Urban Resource Coalition (URC) was established in 2002.

The Urban Resource Coalition is comprised of urban school districts ranging in size from 4,000 school children to 740,000 school children. Its members are superintendents, assistant superintendents, and other administrators, facility managers, directors, and school health personnel. Annually, this coalition comes together to discuss the needs of their schools regarding indoor air quality including the barriers and successes to improving indoor air quality in schools, learn about and discuss resources such as the EPA's *IAQ T&S* Action Kit and discuss ways AASA can be a better IAQ resource to urban districts. This communication continues throughout the year with quarterly newsletters and continued exchange of resources and ideas.

Members of this coalition have produced exceptional projects as a result of their involvement ranging from asthma pilot programs to IAQ science projects in classrooms. Six of the twelve coalition members have received awards from EPA because of their great work and continue to receive recognition from other associations and their individual school districts.

Members of the Urban Resource Coalition include:

Bridgeport Public Schools, Bridgeport, CT; Cedar Rapids Community School District, Cedar Rapids, IA; Charlotte-Mecklenberg Schools, Charlotte, NC; Detroit Public Schools, Detroit, MI; East Valley School District 361, Spokane, WA; Los Angeles Unified School District, Los Angeles, CA; Memphis Public Schools, Memphis, TN; Norwich School District, Norwich, CT; Providence Public Schools, Providence, RI; Saint Louis Park School District, St. Louis Park, MN; Spokane School District 81, Spokane, WA; St. Joseph School District, St. Joseph, MO.

AASA welcomes the addition of any urban school district to join the URC. Just contact the project director, Ericka Plater Turner at eturner@aasa.org or 703-875-0731.